BIBLIOGRAPHIC DATA SHEET	1. CONTROL NUMBER	2. SUBJECT CLASSIFICATION (695)
	PN-AAH-472	DM00-0000-0000

3. TITLE AND SUBTITLE (240)

Stimulating the growth of small-scale industry; final report, year IV: Soong Jun University activities, Jan. 1977 - Jan. 1978

4. PERSONAL AUTHORS (100)

Lodge, D. E.

5. CORPORATE AUTHORS (101)

Ga. Inst. of Technology. Office of Int. Programs

6. DOCUMENT DATE (110)	7. NUMBER OF PAGES (120)	8. ARC NUMBER (170)
1978	56p.	KS338.64.L822-1977

9. REFERENCE ORGANIZATION (130)

Ga. IT

10. SUPPLEMENTARY NOTES (500)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

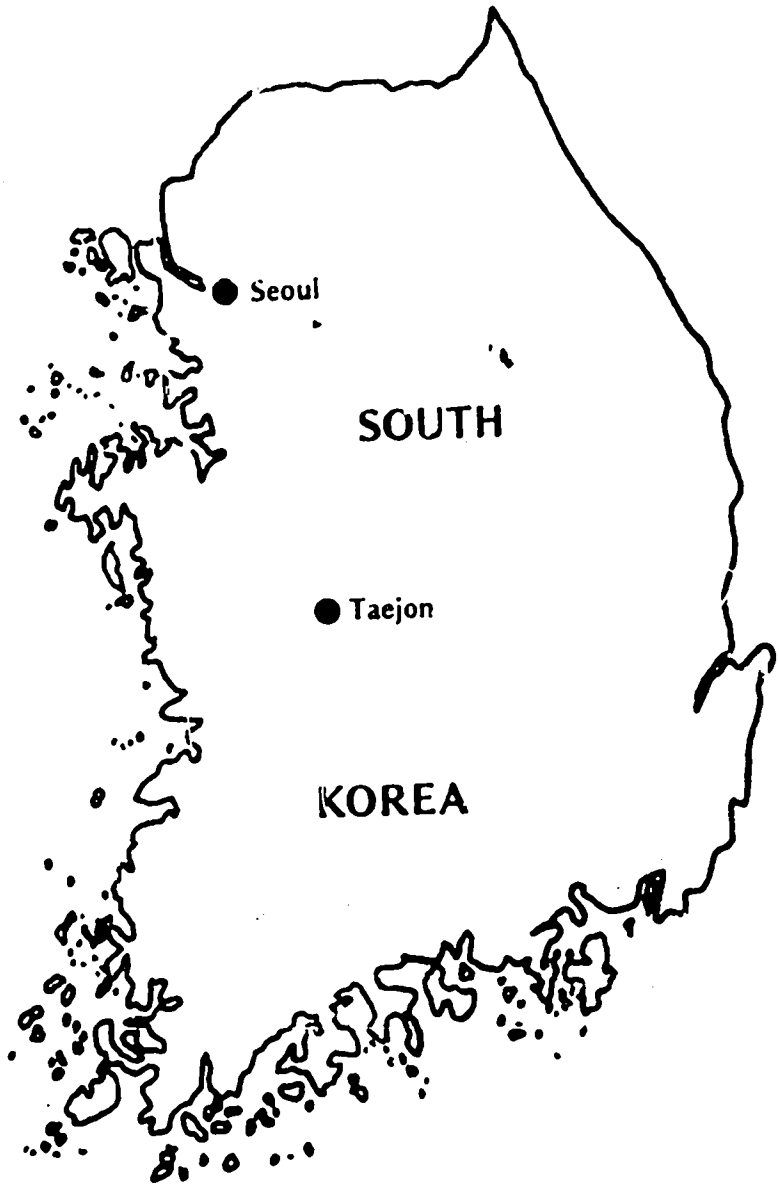
Small scale industries
Industrial training
Industrial extension
Appropriate technology
Employment
Solar energy
Korea Rep.

13. PROJECT NUMBER (150)	
931099000	
14. CONTRACT NO.(14D)	15. CONTRACT TYPE (140)
AID/ta-C-1062	
16. TYPE OF DOCUMENT (160)	
52	

AID 590-7 (10-79)

PN-AAH-472

SMALL–SCALE INDUSTRY GRANT YEAR IV



SOONG JUN UNIVERSITY ACTIVITIES

Grant Period: January 10, 1977 to January 9, 1978

A PROGRAM FUNDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

FINAL REPORT
YEAR IV

SOONG JUN UNIVERSITY
SMALL-SCALE INDUSTRY GRANT

by

Yoon Bae Ouh,

Richard Johnston

and

Donald E. Lodge

Contract No. AID/ta-c-1062

Office of International Programs
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
Atlanta, Georgia 30332, U. S. A.
January 1978

Table of Contents

* * *

Figures

Tables

Page

Tables (Continued)

INTRODUCTION

On January 1977, the Agency for International Development (AID) funded, for the fourth consecutive year, Contract No. AID/ta-c-1062, through which the Georgia Institute of Technology (GIT) was to make available $45,000 grants for small-scale industry development programs to four institutions of higher learning in different geographic regions of the world. Three of the four grants were for the continuation of existing programs with counterparts selected in 1974 and 1975; the fourth grant was for a new counterpart selected in 1977.

Of the three grants for the continuation of existing programs, one went to Soong Jun University (SJU) in Seoul, Korea. This document is the final or end-of-the-year report for the work jointly performed by the staff of SJU in Korea and GIT in Atlanta, Georgia.

When the grant was initiated in 1974, the administration of GIT and the sponsor established the following criteria for the selection of grantee institutions:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential markets for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of the staff.
7. The institution's potential for utilizing the grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

After an initial worldwide search, Soong Jun University was one of the first two institutions selected and the corresponding grant was established. Final (annual) reports were published in 1975, 1976, and 1977. Details of the first three years' activities may be found in those documents.

At the end of Year IV of the program, the following immediate results are indicative of the work performed:

1. A survey of 17 firms receiving technical assistance from SJU during 1977 shows an increase of 120 jobs or a 14.8% increase over the 12-month period.

2. Twenty-eight companies were provided with technical assistance during the year -- 13 in Seoul and 15 in the Taejon area.

3. A firm in Taejon received a $125,000 loan from the Asian Development Bank for a new plant.

4. Audiovisual documentation of this Small Industry Grant program was continued with coverage of both new and old cases.

5. The prototype "cheegay" received final field testing and a manufacturer has agreed to produce 500 units on speculation for test marketing during 1978.

6. SJU established working relationships with Korean national institutions.

7. SJU faculty received national and international recognition for their work with small-scale industry in Korea.

8. SJU's Integrated Development Center (IDC) and Regional Development Institute (RDI) conducted seminars and training courses for small business managers, students, and government employees.

9. RDI published three publications and IDC published one.

PROGRAM PLANS FOR YEAR IV

Background

Soong Jun University (SJU) is a prominent Korean institution of higher learning with strong programs in science, engineering, and management-oriented fields. This university was formed in 1970 when Soong Sil College united with Taejon College to form a new cooperative venture in the field of Christian education. Soong Sil College, in turn, was formed in Pyeng Yong (North Korea) in 1897 and reopened in Seoul in 1954, after being closed in 1938 during the Japanese occupation. Taejon Presbyterian College was founded in 1956 by the Southern Presbyterian Mission in the city of Taejon.

Shortly after Dr. Hahn Been Lee became President of Soong Jun University in 1973, he was contacted by Mr. Ross W. Hammond, Director, Economic Development Laboratory (EDL) of the Engineering Experiment Station at the Georgia Institute of Technology. As a result of these contacts, both institutions established an agreement of mutual cooperation on July 30, 1973.

SJU then presented a proposal to the Georgia Institute of Technology for a program of development for small-scale industries. It was implemented by a grant funded under an existing contract provided to the Georgia Institute of Technology by the Agency for International Development (AID) for this purpose. In 1974, the EDL, in cooperation with SJU, initiated Year I of a program of small-scale industry development. This program was expanded in 1975 (Year II) and continued in 1976 (Year III) under funding by the same sponsor.

The terms of the $45,000 grant permitted the grantee to use half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The remainder of the funds was to be used by the grantee to obtain training and consultation from U. S. technical assistance organizations.

The Georgia Institute of Technology and the Technology and Development Institute, East-West Center, subsequently contracted with the grantee to provide training services and an audiovisual documentation of the project.

The Integrated Development Center (IDC) of Soong Jun University was assigned the responsibility for all program activities for Year III and served as a counterpart to the International Development Branch of EDL (now the Office of International Programs - OIP).

Objective

It is the continuing objective of this project to build a program of industrial extension for small-scale industries at Soong Jun University. Three main areas of activity were considered for Year IV: (1) provision of technical and managerial assistance to small-scale industries in defined geographic areas of the Republic of Korea, (2) development of simple solar energy devices, (3) strengthening the relevancy of the existing educational program of the university, and (4) provision of training activities for small-scale industry.

At the end of this multi-year project, the sponsor anticipates that SJU will have in operation a well-trained staff that will be fully capable of continuing the provision of technical assistance services to small-scale industries in the area. This service will be provided by the then technically competent members of the SJU indigenous staff trained under this program.

Total Project Goals of the AID/ta-c-1062 Contract

At the start of the Small-Scale Industry Grant on January 23, 1974, the following total goals had been established by the Agency for International Development for the Georgia Tech grant, to be achieved over a period of four years:

> The general objective of this contract is to generate employment in developing countries, particularly outside the metropolitan centers, by: (a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative approaches to technical assistance to small industry, and (c) infusing the governmental, industrial, and financial sectors of the local community selected to provide employment with an understanding of the techniques of generating jobs. The above objectives will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations.

Once the total project goals are reached, the sponsor anticipates the following outputs:

1. Increased job opportunities in four ccuntries.
2. Increased viability of indigenously owned enterprises.
3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC institutions.
5. Evaluation reports on successes and failures in assisting small industry.

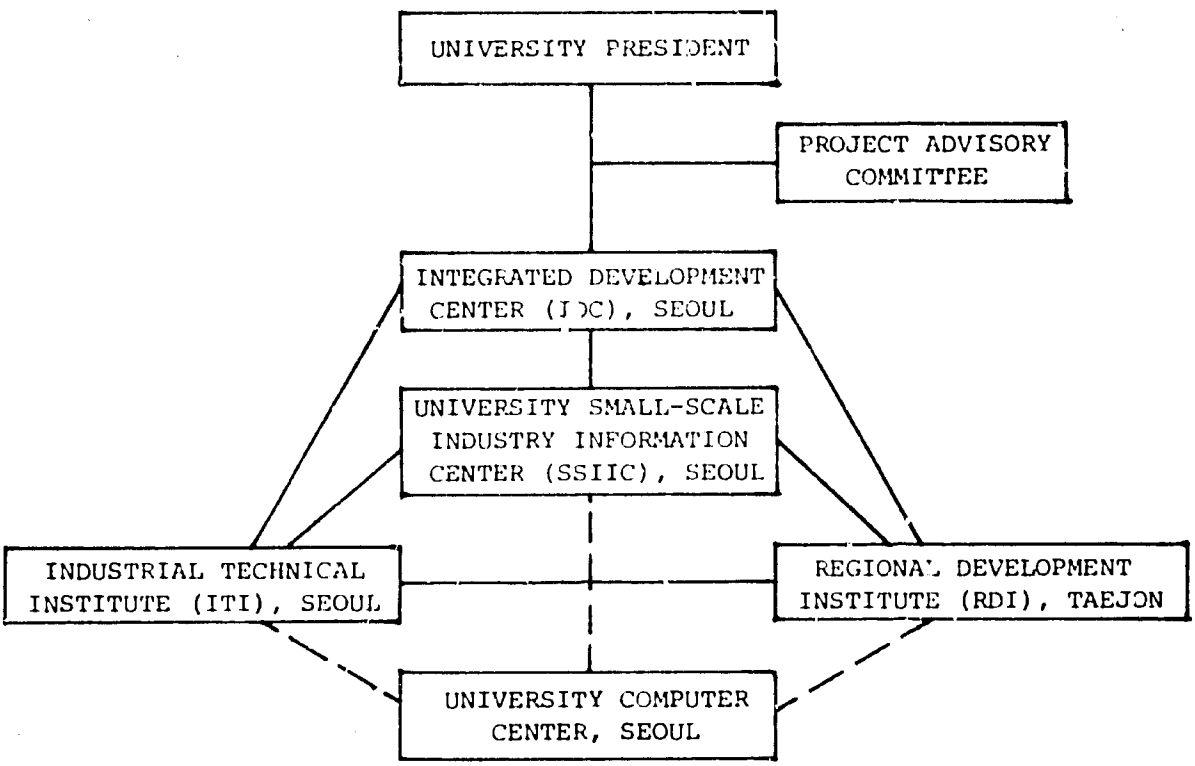
Most of the established goals for Year IV were met, plus several additional accomplishments which were listed in the Introduction and will be amplified in the balance of this annual report.

At the time the Year IV program was initiated (on January 10, 1977), the SJU organizational structure was as presented in Figure 1.

Upon his selection as president of the university, at the time Dr. Hahn Been Lee's term expired, Dr. Bum Joo Koh designated Dr. Yoon Bae Ouh, Head of the Integrated Development Center (IDC), to continue to serve as Counterpart Project Director. Mr. Nelson C. Wall is Project Director and Mr. Richard Johnston is Project Coordinator for Georgia Tech's portion of the program.

Figure 1

ORGANIZATIONAL STRUCTURE OF SOONG JUN UNIVERSITY
(January 1977)



Program of Work

The Year IV proposal presented a program of work on the basis of the work that had been implemented and evaluated during the third 12 months of the project. The following activities were then scheduled for the fourth 12-month sequence (Year IV), most of which have been implemented:

1. Technical/Managerial Assistance

a. Emphasis will continue to be placed on the mechanical engineering area, but expansion into other technical areas will proceed as begun in 1975 and carried forward in 1976. During the latter year, assistance was provided in textile engineering, electrical engineering, chemical engineering, electronic engineering, and commercial design in both the Seoul and Taejon areas.

b. Managerial and industrial engineering assistance will continue to be expanded, with emphasis on quality control and general industrial management techniques.

c. During 1977, emphasis will continue to be placed on more efficient energy management in small-scale Korean industries. This is extremely important because of the very high costs of energy in Korea, which imports all its oil and has relatively little water power or other major domestic energy sources.

2. Solar Energy and Small-Scale Industries. With continuing technical assistance from the Georgia Institute of Technology, SJU's engineering staff will seek to develop simple and inexpensive devices to utilize solar energy. These may be usable in small-scale industries or be suitable for production and sale by small firms. Work also will be conducted on the redesign of the traditional Korean greenhouse to provide a more efficient design for the use of small farmers, using the above-mentioned solar devices.

During 1976 an experimental solar collector was built and put into observation on the Seoul campus. Research aimed at a more efficient and less expensive design will continue during 1977, with actual production and marketing anticipated for 1978. Prototypes now being marketed in other nations will be collected for study and adaptation to the Korean situation.

SJU will continue to work with Georgia Tech and the Korea Institute of Science and Technology in matters related to practical, marketable solar devices for production and use in Korea.

3. Appropriate Technology. The SJU staff already has been engaged in some development of appropriate technology, such as the "cheegay," the tensile strength tester, the shaving die, and the immersion pyrometer. Much work was done during 1976 on the design and production of prototypes of a wheeled "cheegay." During 1977, this item will be redesigned to reduce the weight and the cost, and then manufacturers will be sought for the final design. The SJU staff will continue to seek out needed low-cost items and design these for small-scale industry and the small farmer.

4. Organizational Linkages and Information Exchange. The joint SJU/GIT program, from its inception, has sought to facilitate linkages between various industry and governmental agencies interested in small and medium-scale industries. During 1977, an information exchange between SJU and various agencies will be continued. Information useful to small-scale industry will be made available via SJU's Small-Scale Industry Information Center. SJU will make continuous efforts in 1977 to collect and disseminate more managerial and technical information to small-scale industries, with special reference to items 1, 2, and 3, above. While through 1976 the collection has concentrated on printed materials, starting in 1977 audiovisual materials will receive greatest priority.

5. Training Programs. During 1976, SJU began offering seminars for industrial managers. A short-term course was given to owners, managers, and engineers from firms belonging to the Korea Communication Instrument Industry Association, with some 50 in attendance. Industry and government interest continues to be strong for training in such areas as quality control, energy management, and programs for owners, managers, engineers, and unskilled workers. Training courses will run from two to three weeks and will be held either on the SJU campus or in the plant.

The basic texts, instructional materials, etc., will be developed by the SJU/GIT team. Areas to be covered will include technical topics such as quality control and the effective utilization of existing plant and equipment, but also such general management topics as cost analysis, production control, and entrepreneurial development. Joint SJU/GIT training activities are of high priority in the 1977 program.

6. Educational Activities. 1976 was the second year of operation for SJU's new Industrial Engineering Department. This department was established in connection with the joint SJU/GIT project.

During 1977, it is planned that the following activities will be carried out:

a. various training seminars for the faculty and students
b. assessment of the joint SJU/GIT program
c. development of written and audiovisual case histories
d. U. S. training for faculty members

Use of Grant Funds by SJU

For the 1977-1978 grant year, the grantee was funded by AID in the amount of $45,000. These and other funds were disbursed by SJU as shown in Table 1.

Table 1

DISBURSEMENT OF GRANT AND OTHER PROJECT FUNDS
SJU - YEAR IV
(in U. S. dollars)

	Funds by Source			
Expenditures	AID[1/]	Ind.-Univ. Foundation[2/]	SJU[3/]	Total
Direct Salaries and Wages	$ 9,720	$8,500	-	$18,220
Travel				
International	3,940	-	-	3,940
Local	-	1,000	-	1,000
Materials/Supplies	6,660	-	-	6,660
Conferences/Seminars	2,180	-	-	2,180
Contracted Services (GIT)				
OIP Consulting	20,500	-	-	20,500
Audiovisual Documentation	2,000	-	-	2,000
SJU Indirect Expenses				
General Overhead	-	-	$ 8,000	8,000
Technical Service Support	-	-	3,000	3,000
Totals	$45,000	$9,500	$11,000	$65,500

1/ From AID Small-Scale Industry Grant.

2/ The Industry-University Foundation is an organization in Korea designed to promote mutual cooperation, to which SJU applied for and received a grant.

3/ Normal overhead allowance plus depreciation allowance for use of university labs and workshops.

SOONG JUN UNIVERSITY ACTIVITIES DURING PROGRAM YEAR IV

The SJU staff, on both the Seoul and Taejon campuses, carried out the major portion of the work programmed for Year IV. The following sections highlight some of the activities.

Technical/Managerial Assistance

This continues to be the main portion of the joint program. It was originally planned to provide technical assistance to small-scale industries using the industrial extension service approach. According to the records of the SJU staff, during Year IV, 13 companies were provided with assistance by the Seoul campus staff and another 15 companies by the Taejon campus staff. A listing of the companies served, with particulars on each, is presented as Appendix 1 of this report.

A significant result of the technical and managerial assistance work carried out by the SJU/GIT team during Year II (1975) was the granting in early 1977 of a loan for US$125,000 by the Asian Development Bank to a manufacturing firm located in Taejon. The director of RDI, the president of SJU, and Dr. David Pyffe of GIT had written letters of recommendation to the Asian Development Bank in support of this loan application. The new plant is now under construction and will be in operation in early 1978. The new facility will permit plant employment to increase substantially.

Employment Generation

Another interesting development in the Year IV program conducted by the SJU staff was a survey of 17 companies (seven served by the Seoul campus staff and 10 served by the Taejon campus staff) that had received technical assistance at some time during the period from 1974 to 1977. (See Tables 2, 3, and 4.) The survey's purpose was to determine the employment changes within the selected assisted industries. For the two campuses (Table 4) the survey indicated a gain of 159 jobs during 1976 and 120 during 1977, for a total gain of 279 jobs between the end of 1975 and the end of 1977. These constitute increases of 24.4%, 14.8%, and 42.9%, respectively.

Solar Energy and Small-Scale Industries

Several items of solar energy hardware had been developed or were under development at the year's end. These included continuing work in Seoul on the

Table 2

SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES
ASSISTED BY SOONG JUN UNIVERSITY, SEOUL, 1977

Technical Assistance Case No.	Employment				Change		
	Beginning of 1974	End of 1975	End of 1976	End of 1977	1976-77	1974-77	To Date
B	*	14	21	26	5	-	12
D	14	14	29	37	8	23	23
E	104	142	155	195	40	91	91
F	37	36	40	76	36	39	39
G	19	30	43	53	10	34	34
H	52	52	74	90	16	38	38
J	*	39	98	105	7	-	66
Total	226	327	460	582	122	225	303

* Case begun following year.

Source: Soong Jun University, Survey Data, 1977.

Table 3

SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES
ASSISTED BY SOONG JUN UNIVERSITY, TAEJON, 1977

Technical Assistance Case No.	Employment			Change		
	End of 1975	End of 1976	End of 1977	1975-76	1976-77	To Date
A	38	14	*	-24	-14	-38
C	32	23	23	- 9	0	- 9
D	77	95	98	18	3	21
F	56	60	61	4	1	5
H	25	26	32	1	6	7
I	13	18	14	5	- 4	1
J	3	5	6	2	1	3
K	5	12	12	7	0	7
L	45	66	66	21	0	21
M	30	31	36	1	5	6
Total	324	350	348	26	- 2	24

* Closed.

Source: Soong Jun University, Survey Data, 1977.

Table 4

SUMMARY OF EMPLOYMENT CHANGES OF SURVEYED COMPANIES
ASSISTED BY SOONG JUN UNIVERSITY, BOTH CAMPUSES, 1975-1977

	Employment			Change		
	End of 1975	End of 1976	End of 1977	1975-76	1976-77	1975-77
Seoul	327	460	582	133	122	255
Taejon	324	350	348	26	- 2	24
Total	651	810	930	159	120	279

Source: Soong Jun University, Survey Data, 1977.

solar flat plate collector project begun in 1976. A second generation collector is being designed, utilizing lighter weight, less costly indigenous materials, and providing a higher rate of efficiency. The goal of this project is a collector design which can be produced in commercial quantities by small-scale industry at a price affordable by Korean consumers.

During 1977, an experimental solar water heater was built at Ma Dong Village in Wae-San Myon by Professor Charles Krauth of the Taejon campus. He also constructed an improved hothouse for use by small farmers. This unit is made of clear polyethylene sheeting, plastic pipe, and styrofoam insulation sheeting. Rocks are used as a heat storage medium, and styrofoam is placed on the northern wall to act as a reflector and insulator, keeping the north winds out and reflecting the sun's beams down onto the rock. This hothouse is located near Ma Dong Village, close to a favorite resting place of the farmers as they come through the area collecting firewood, giving maximum exposure to the hothouse by the farmers.

The Seoul campus staff also erected and tested a windpower-driven water pump during 1977.

Appropriate Technology

Activities by the Taejon campus staff in the field of appropriate technology continued to concentrate on the development of an improved "cheegay." During 1977, two new models were designed, based on previous testing; prototypes were fabricated; and both models were tested in the field through actual use in rural and urban situations. The latest model was then selected for full-scale production and test marketing. A manufacturer has agreed to produce 500 units on speculation and test market them during 1978. The Taejon campus staff will provide technical assistance and monitor the sales and user reactions during 1978.

Professor Charles Krauth of the Taejon campus staff has developed a semi-portable methane gas generator utilizing animal dung.

Organizational Linkages and Information Exchange

As a result of the AID-sponsored Small Industry Grant, over the past four years, SJU has been able to lay the necessary groundwork in order to gain

recognition as a leading Korean educational institution in the field of stimulating and fostering small-scale industry. This is reflected in the following:

1. During 1977, SJU established linkages with the Korea Credit Guarantee Fund (KCGF), the Korea Federation of Small Business (KFSB), the Korea Ministry of Commerce and Industry (KMCI), and the Korea Medium Industry Bank (KMIB).

2. SJU provided the following services to these agencies or organizations:

   a. Acted as management consultants regarding their small industry programs.

   b. Provided information on a variety of managerial and technical subjects.

   c. Provided management and technical assistance to small industrial firms, at the request of the above-mentioned agencies or organizations.

   d. Dr. Ouh served as Secretary-General of the Korea Committee, Korea Federation of Small Business' Fourth International Symposium on Small Business, which was held in Seoul on October 10-14, 1977. Some 300 persons representing over 45 nations were in attendance.

   e. Dr. Ouh now is serving as a member of the Small Industry Development Policy Committee of the Korea Ministry of Commerce and Industry.

   f. At the invitation of the Korea Federation of Small Business, Dr. Ouh delivered a keynote address on "Small Industrial Development Problems in Developing Countries" at a joint symposium between Korea and the Republic of China, held in Taipei on August 1-5, 1977.

   g. Dr. Ouh and Professor Young Chi Chang conducted a seminar on "Management and Technical Improvement for Small Business." Organized by the Korea Medium Industry Bank, this seminar attracted representatives of some 40 industrial firms.

   h. A seminar was conducted on "Management Improvement" for the Korea Communications Instrument Manufacturing Industry Association. Some 50 persons representing manufacturing firms attended.

i. A joint seminar was conducted with the Korea Federation of Small Business on "The Present and Future Role of Small Business in the Korean National Economy," attended by 100 persons.

j. SJU conducted two seminars for the Korean Credit Guarantee Fund on "Technology Improvement for Small Industries." About 120 members of the Fund's staff attended one of these seminars.

k. Dr. Seyeul Kim was nominated to be and is now a consultant to the Taejon Branch of the Korea Credit Guarantee Fund.

l. Dr. Seyeul Kim was nominated to become and is now an economic advisor to the Association of Industry Men in Taejon.

m. Dr. Seyeul Kim was nominated to become a member of the Advisory Committee for the Christian Children's Fund.

The Regional Development Inscitute on the Taejon campus received the donation of over 160 textbooks from the Asia Foundation. Subjects covered included economics, city planning, and regional development. These volumes constituted a significant addition to the RDI's reference library.

Training Programs

Five seminars were conducted for managers and staff members of small industrial concerns. These included a seminar on "Management and Technical Improvement for Small Business," sponsored by the Korea Medium Industry Bank. Representatives came from over 40 firms.

Some 50 managers, engineers, and owners attended the second presentation of a seminar, "Management Improvement," for the Korea Communication Instrument Manufacturing Industry Association. The first presentation occurred in 1976.

A seminar on "The Present and Future Role of Small Business in the Korean National Economy" was presented to 100 small business owner/managers. This program was jointly sponsored by SJU and the Korea Federation of Small Business.

Two seminars on "Technology Improvement for Small Industries" were presented before a total of 120 personnel of the Korea Credit Guarantee Fund.

Dr. Seyeul Kim of the RDI presented his lecture on "Regional Development" to ten classes of the Korea Government Officials' Training Institute, held in Seoul, during 1977.

Educational Activities

A number of programs were carried out for the purpose of providing training for the faculty and students of SJU. The RDI conducted the following:

A three-hour seminar on "Regional Development" was conducted on November 15, 1977, with almost 300 students, faculty, and other interested persons in attendance. Two of the three papers presented at this meeting were by students of SJU/Taejon.

A seminar on "Future Forecasting" was presented on February 22, 1977, by Dr. Samuel N. Barzarkay of the Tel Aviv University in Israel. Participants included SJU students and faculty members as well as local government officials, industry representatives, and the press.

A course in "Development, Cooperation, and Labour Studies" was held June 7-11, 1977. This was a joint venture of the RDI, the Korea Cooperative Education Institute, and the International Institute for Development Cooperation and Labour Studies, Tel Aviv, Israel. It was attended by the students of the RDI.

RDI presented a seminar on the "Fourth Korea Five-Year Economic Development Plan," in cooperation with the Korea Economic Planning Board. Participants included SJU faculty and students, and local government and industry representatives.

Mr. Chong Bonk Choi also completed the one-year program at the Settlement Study Centre and is now studying at the Asian Institute of Technology in Thailand.

A course in "Regional Development in Korea" was presented as a joint program by the RDI and a faculty member from Lewis and Clark College, Portland, Oregon. This was attended by 17 students from the latter institution from April 30 to June 30, 1977. It included lectures by the universities' faculties and by administrators and practitioners from various institutions and organizations involved in regional development.

Mr. Tae Myong Kim has been awarded a full scholarship, including air fare and living expenses, for a two-year Master's degree program in Human Settlement Planning and Development at the Asia Institute of Technology, Thailand. He will begin this program, funded by the Asia Institute of Technology, in 1978.

Dr. Bum Soe Koh, president of SJU, traveled to Guatemala City in September 1977 to attend a four-day conference, "Issues Related to Small Industries Appropriate Technologies." Sponsored by GIT and attended by representatives from 10 of GIT's 11 counterpart organizations, this conference proved an ideal format for quickly acquainting the newly appointed president of SJU with a comprehensive view of small industry programs in these other LDCs. Following the Guatemala City conference, Dr. Koh traveled to Atlanta to meet with Dr. Pettit, President, GIT; Mr. Ross Hammond, Director, Office of International Programs, GIT; and other GIT officials. The meetings provided an opportunity to discuss this joint SJU/GIT program and to explore ideas for potential future joint programs.

The RDI sponsored a seminar, "The Trend of Regional Development in the World," before approximately 100 students and faculty members. This was a presentation by Mr. Kyong Bae Park, Researcher, RDI, of the study report which he completed while in residency at the Settlement Study Centre in Israel between December 1976 and November 1977. All expenses for Mr. Park's training were paid by the Settlement Study Centre. Mr. Park is now working with small-scale industries in the Taejon area under this SJU/GIT program.

Dr. William M. Sangster, Dean, College of Engineering, Georgia Institute of Technology, Atlanta, Georgia, worked with Soong Jun University during the period May 2-7, 1977. Dr. Sangster conferred with officials at Soong Jun University and the Office of Education for Korea of the USAID/Korea. Dr. Sangster's work primarily concerned accreditation of the engineering schools in Korea. He presented two seminars at Soong Jun University -- one to the administrative heads of the Engineering Department of Soong Jun University and the second to approximately 20 deans of other engineering schools in Korea. Dr. Sangster also accompanied various members of the SJU extension staff on visits to small industries and spoke to various groups in Korea about the solar energy research being conducted at Georgia Tech.

Other Activities

The SJU/GIT small industry grant program has generated other significant activities of benefit to SJU. Some of these are not quantifiable. Specifically, it is difficult to assess the increased respect SJU has acquired from its work with small-scale industries and its association with GIT. However, OIP personnel have been told by Korean students and faculty that Korean university

students have come to realize that the engineering education at SJU is of high quality and commands academic, industrial, and governmental respect. This is demonstrated by the approximately 600 applicants who took a qualifying examination in November 1977 for about 80 student openings in the industrial engineering department.

Other quantifiable benefits include the following:

1. The Presbyterian Church in the United States granted SJU $8,500 for an Anti-Hunger Program, which included support for the greenhouse and biogas generator projects.

2. The Korean Credit Guarantee Fund has granted some $10,000 for industrial extension services for 1978.

3. The Korean Federation of Small Business granted some $10,000 for industrial extension services for 1978.

4. The Korean Ministry of Education granted $5,000 in 1977 for research on wind power.

5. The Scholarship Foundation of the Korea Traders Association provided $3,000 in 1977 for research related to industrial extension activities, with a somewhat greater amount of money expected for support of 1978 activities.

6. SJU officials expect to receive additional funds from the Asia Foundation for work in appropriate technology.

SJU has published four reports during 1977. The RDI was responsible for three, as follows:

"A Case Study on the Possibility of Improving Simple Traditional Farm Equipment in Korea," available only in Korean, but with work on an English version now under way.

Theory and Practice of Community Development, a book published in Korean.

A pictorial monograph on the cheegay, published in Korean in 1977 and to be published in English by GIT in early 1978.

In addition, "Model Curriculum for a Department of Community and Regional Development" will be published in 1978 under a grant from the Korea Ministry of Education.

The Seoul campus published "A Case History of Industrial Extension Service (Sam-Shin Sewing Machine Company)."

GEORGIA INSTITUTE OF TECHNOLOGY ACTIVITIES DURING PROGRAM YEAR IV

The activities of the Office of International Programs under Year IV of the program were initiated by the Project Director on January 10, 1977, when the sponsor advised the Georgia Institute of Technology that the small-scale industry project for Korea would be extended another year. From mid-February to early March, Mr. Richard Johnston provided on-site assistance in the project. He was followed by Dr. William M. Sangster, Dean, School of Engineering, during May 2-7. Dr. L. Harlan Davis and Mr. Ross W. Hammond visited on October 14. Ms. Edwina Ware and Mr. Donald E. Lodge worked at SJU November 13-27. Dr. Bum Soe Koh, President, Soong Jun University, attended the Guatemala City conference and visited OIP in Atlanta during September.

February 14-March 8, 1977 (Mr. Richard Johnston)

Mr. Johnston worked with SJU staff on their industrial extension services to small-scale industry. He assisted the SJU staff in the acquisition of contract work for SJU from the Korean Credit Guarantee Fund. The Project Plan for Year IV was prepared, as shown in Figure 2.

May 2-7, 1977 (Dr. W. M. Sangster)

Dr. Sangster presented two seminars concerning accreditation of engineering schools to the heads of Korea's engineering schools. He also visited a number of small-scale industries with the SJU staff.

September 6-10, 1977 (Dr. Bum Soe Koh)

As President of Soong Jun University, Dr. Koh represented his university at the Guatemala City Conference on "Issues Related to Small Industries Appropriate Technologies." This conference was attended by representatives of other institutions working under the Small Industry Grant program and of the OIP counterpart institutions. Ten LDCs were represented at this meeting.

September 11-14, 1977 (Dr. Bum Soe Koh)

Dr. Koh visited OIP at Atlanta, Georgia, where he met with the OIP staff and other high officials of GIT with whom he discussed the small-scale industry program at SJU, future cooperative efforts between the two institutions, and possible funded contract work for SJU/GIT in Korea.

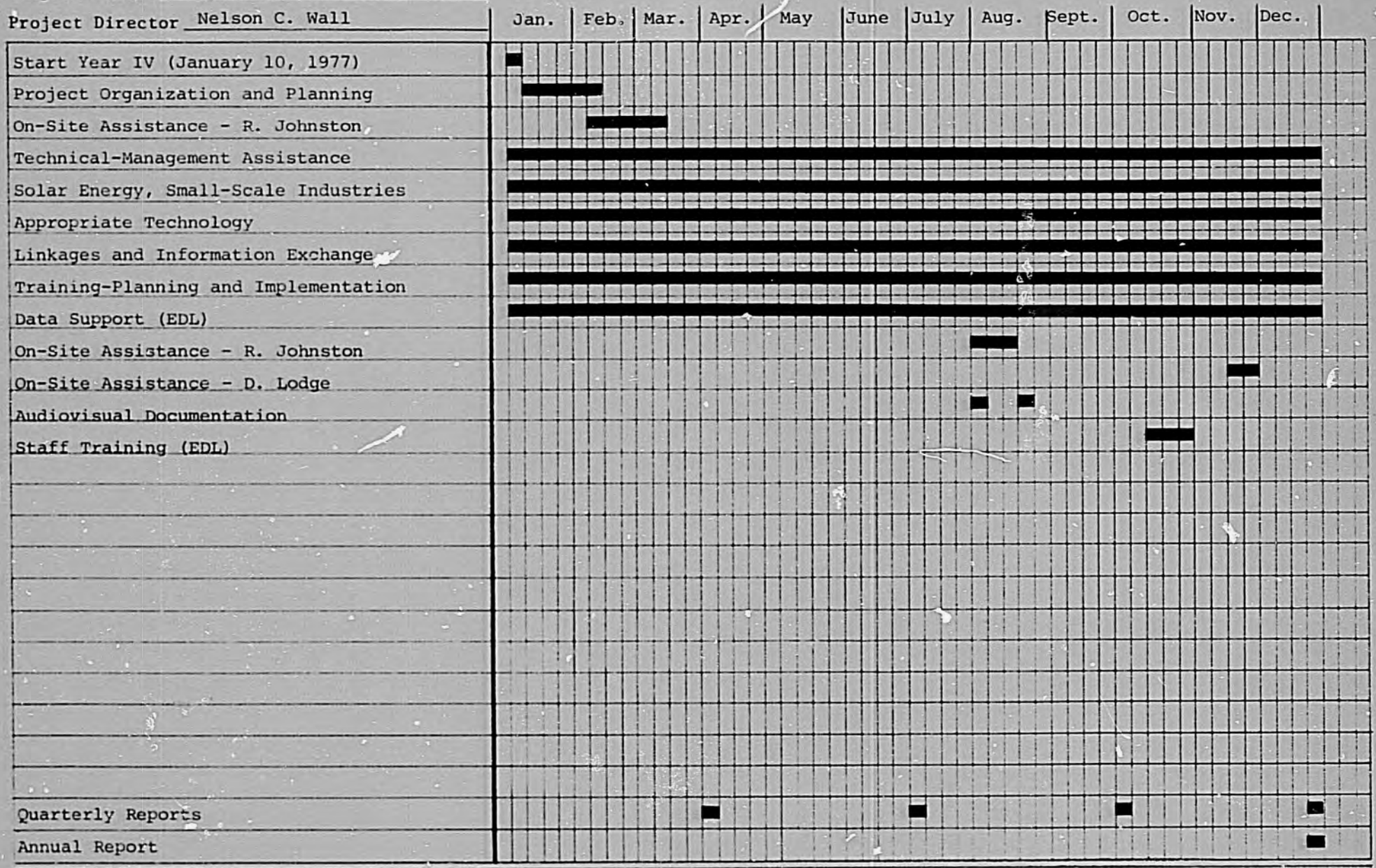
Figure 2

PROJECT PLAN

Project No. B-426 - Year IV

Project Title SIG - Soong Jun University

Project Director Nelson C. Wall



LEGEND

October 14 (Dr. L. H. Davis and Mr. R. W. Hammond)

Dr. Davis and Mr. Hammond visited SJU to introduce Dr. Davis to SJU and to discuss SIG activities. Mr. Hammond was in Korea at the invitation of the Korea Federation of Small Business to present a paper before the Fourth International Symposium on Small Business, held in Seoul on October 10-14, 1977.

November 13-19 (Ms. Edwina Ware)

Ms. Ware conducted the Year IV audiovisual documentation of the SJU SIG program.

November 13-26 (Mr. Donald E. Lodge)

Mr. Lodge participated in the audiovisual documentation, provided consultation and training and, together with Dr. Ouk, Counterpart Project Director, compiled annual report data.

RESULTS AND CONCLUSIONS

The fourth year of this small-scale industry development program continued the progress of previous years. In this section, the major accomplishments of Year IV will be highlighted.

1. The professional staff at SJU again conducted an in-depth survey of small-scale industries in the program. These companies received technical assistance services from SJU during 1977. In summary, 120 new jobs have been created in Year IV, an increase of 14.8%.

2. The joint SJU-GIT team provided technical assistance to a total of 28 small-scale industries, of which 13 were in Seoul and 15 in the Taejon area. This assistance was accomplished by 109 on-site plant visits.

3. The SJU staff designed a second-generation solar collector panel using indigenous materials, with the ultimate goal of developing a prototype collector which can be produced in Korea. The SJU staff also erected and tested a windpower-driven water pump. An experimental hothouse and water heater were built to demonstrate the use of solar power for heating.

4. Field testing of the prototype "cheegay" was completed and a manufacturer has been located who will build 500 units for test marketing during 1978. The SJU Taejon staff also developed a semiportable methane gas generator which utilizes animal dung.

5. SJU established working linkages with the Korean Credit Guarantee Fund, the Korean Federation of Small Business, the Korean Ministry of Commerce and Industry, and the Korean Medium Industry Bank. The staff provided services to the above-listed institutions in capacities such as management consultants, technical and managerial information resources, and management and technical extension assistants.

6. Dr. Ouh served as Secretary-General of the Korean Committee for the Korea Federation of Small Business' Fourth International Symposium on Small Business.

7. Dr. Ouh presently serves as a member of the Small Industry Development Policy Committee of the Korea Ministry of Commerce and Industry.

8. Dr. Ouh delivered the keynote address on "Small Industrial Development Problems in Developing Countries" at a joint symposium between Korea and the Republic of China, held in Taipei.

9. Professor Young Chi Chang and Dr. Ouh conducted five seminars on "Management and Technical Improvements for Small Business" to representatives of 40 industrial firms.

10. SJU conducted the second annual seminar on "Management Improvement" to 50 persons representing firms of the Korea Communications Instrument Manufacturing Industry Association.

11. A joint seminar, attended by 100 persons, was conducted jointly with the Korea Federation of Small Business on "The Present and Future Role of Small Business in the Korean National Economy."

12. SJU conducted two seminars, attended by about 120 staff members, for the Korea Credit Guarantee Fund on "Technology Improvement for Small Industries."

13. Dr. Seyeul Kim became a consultant to the Taejon Branch of the Korea Credit Guarantee Fund.

14. Dr. Seyeul Kim became an economic adviser to the Association of Industry Men in Taejon.

15. Dr. Seyeul Kim became a member of the Advisory Committee for the Christian Children's Fund.

16. The Regional Development Institute on the Taejon campus received a donation of over 160 textbooks from the Asian Foundation.

17. Dr. Seyeul Kim presented lectures on regional development to ten classes of the Korea Government Officials' Training Institute, held in Seoul.

18. RDI presented a seminar on regional development to some 300 students and faculty of SJU.

19. RDI conducted a seminar on future forecasting, led by Dr. Samuel N. Barzarkay of the Tel Aviv University.

20. The students of RDI attended a course on "Development, Cooperation and Labour Studies" jointly sponsored by RDI, the Korea Cooperative Education Institute, and the International Institute for Development Cooperation and Labour Studies.

21. RDI presented a seminar on the Fourth Korean Five-Year Economic Development Plan.

22. RDI presented a course in regional development to 17 students from the Lewis and Clark College.

23. Mr. Tae Myong Kim was awarded a fully paid scholarship for a two-year master's program at the Asian Institute of Technology in Thailand.

24. Mr. Chong Bonk Choi completed a one-year program at the Settlement Center and is now studying at the Asian Institute of Technology in Thailand.

25. Dr. Bum Soe Koh attended a four-day conference in Guatemala City concerning "Issues Related to Small Industries Appropriate Technologies."

26. Dr. Bun Soe Koh met with Dr. Pettit, President of Georgia Tech, and other GIT officials to discuss past and future activities between SJU and GIT.

27. Dr. William M. Sangster, Dean, College of Engineering, Georgia Institute of Technology, advised SJU engineering administrators and 20 other deans of engineering colleges in Korea concerning accreditation.

28. RDI published three publications in 1977, as follows: "A Case Study on the Possibility of Improving Simple Traditional Farm Equipment in Korea," Theory and Practice of Community Development, and a pictorial monograph on the cheegay.

29. The Seoul campus published "A Case History of Industrial Extension Service (Sam-Shin Sewing Machine Company)."

Appendix 1

SUMMARY OF TECHNICAL ASSISTANCE CASES

SUMMARY OF TECHNICAL ASSISTANCE CASES
1977

Seoul Area

Name of Firm	No. of Visits
Chun-Il Motor Parts Manufacturing Company	12
Sam Hongsa Limited	4
Dong Bang Machinery Company	2
Seoul Precision Engineering Company	2
Sam Ho Wood Working Machine Company	6
Sam Wom Industrial Company	6
Sam-Shin Sewing Machine Company	8
Kwang Shin Machine Company	1
Sam Yang Chain Company	1
Han-Kook Textile Company	2
Kook-Je Industrial Company	3
Nam-Il Milling Machine Company	4
Nam-Sun Lathe Company	3
	54

Taejon Area

Keum Nam Industrial Company, Ltd.	6
Huk Shin Chemical Company	4
Dong-A Pencil Industrial Company	3
Hapsung Textile Company	5
Measung Agricultural Chemicals Company	2
Kyung In Moolsan	3
Chang Ik Industrial Company	6
Han Mi Paint Company	5
Tae-A Industrial Company	2
Sam Sung Sodium Chloride Company	3
Tae-Gwang Oxygen Company	2
Tae-Dong Food Industrial Company	2
Dae Won Food Company	4
Han Mi Towel Company	7
Hong-Do Food Plant	1
	55

CASE NO. 1

MAIN PRODUCT: STEERING AND SUSPENSION SYSTEM PARTS FOR MOTOR CARS

Municipality: Seoul

Brief Description of Problem

Inefficient materials-handling processes; lack of production control procedures; absence of cost-accounting system; need for improvements in methods.

Applied Solution

In cooperation with the staff of the company, process charts, route sheets, master material lists, and other basic control records were compiled for eight standard manufactured products. As a basic measure for materials-handling improvement, the use of standardized tote boxes was strongly recommended and eventually adopted. Layout and assembly methods in the final assembly section were improved. The practice of assigning job orders and job numbers was introduced, and a new reporting procedure which identifies and reports man-hours and materials consumed according to job order was installed.

An employee training program was completed to disseminate the basic knowledge of work method improvement for all employees and to create a cooperative atmosphere for further implementation. A total of 153 employees attended five sessions.

After the company received a 65-million-won order from the procurement agency of the Korean Ministry of Defense, it was decided to use this opportunity to test the proposed cost-accounting system on this order prior to a full-scale introduction of the costing system. The test results were compiled by SJU and presented to the company, enabling the company to:

1. determine actual costs and cost differences for each product;
2. understand the relative weight of each cost element;
3. secure national measures for reducing costs;
4. compile cost data, such as expenditure of unit man-hours consumed, variable and fixed costs of the company, etc.

CASE NO. 2

MAIN PRODUCT: SCALE-MODEL RAILROAD LOCOMOTIVES

Municipality: Seoul

Brief Description of Problem

A problem occurred in the fabrication of a subassembly which prevented final product assembly for roughly 60% of a product run.

Applied Solution

Analysis of the unassembled models determined errors in the parts design and imperfections at the intermediate inspection stage. Systematic measures were established to prevent a recurrence of this problem.

Practical instructions were given to the management concerning quality control techniques such as Pareto-analysis, C.E. diagrams, and process capability. Instructions were given concerning the statistical methods of quality control and X-R control charts.

A proposal was discussed concerning the organization of a department of technical management and effective ways to utilize it.

CASE NO. 3

MAIN PRODUCT: LATHES AND MILLING MACHINES

Municipality: Seoul

Brief Description of Problem

Lack of gauges and measuring devices resulted in imprecise work.

Applied Solution

Instructions were given regarding the measurement of accuracy of lathes and milling machines using K.S. standards and the use of measurement apparatus. In addition, practical demonstrations and instructions were given concerning problems in sectional measurement.

The SJU team demonstrated that gauges are efficient when products of the same size and shape are measured, and instructions were given in the techniques of gauge manufacturing.

(Continued)

CASE NO. 3 (Continued)

Applied Solution (Continued)

Instructions also were given in techniques to follow when putting a test bar in the head stock to set up the automatic tolerance mechanism.

The product and material control department was instructed in how to establish controls for stock regulation and materials flow. This department was also assisted in the establishment and application of a parts numbering system.

Instructions were given in the techniques of manufacturing jigs and fixtures and of testing and product inspection.

Products of an inferior quality were investigated to determine which processes and operators were causing the defects. The inferior products were identified by inspection and by recording these defects on checklists designed to identify systematically the offending process. Necessary measures were then made to reduce the production of inferior products.

CASE NO. 4 MAIN PRODUCT: FIRE WARNING DEVICES AND ELECTRONIC COMPONENTS

Municipality: Seoul

Brief Description of Problem

The need to make room for additional equipment and a high rate of defective or unsuitable finished items.

Applied Solution

The SJU team prepared a drawing of a proposed layout, based on a study of the effect of the addition of new machinery on the arrangement of existing machine tools.

Instructions were given in the techniques of inspection necessary to achieve a standard product. Standards were drawn up for the inspection system required for each of the various products.

The percentage of unsuitable products was reduced by giving assistance in the manufacture and utilization of gauges for simple measurements of raw materials and assemblies.

CASE NO. 5 MAIN PRODUCT: WOODWORKING MACHINES

Municipality: Seoul

Brief Description of Problem

The need for a catalog of woodworking machines manufactured by the company.

Applied Solution

The mechanism and characteristics of the five kinds of woodworking machines produced by the company were examined and various features of each machine were photographed. The text of the catalog describing each machine was prepared, using the data and photographs obtained by investigation and study. In addition, an English language catalog for export is being prepared.

CASE NO. 6 MAIN PRODUCT: P. V. C. JACKETS

Municipality: Taejon

Brief Description of Problem

Personnel problems concerning the wage structure, communications, decision making, and promotion criteria.

Applied Solution

The SJU team recommended that the company combine a time rate plan with a simple rate plan and divide the employees in groups based on similarity of work on the production line. The members of each group would compete among themselves with respect to production, output, absentee rate, quality of work, and other factors. The group rating highest in the above respects would be rewarded with wage increases. This arrangement would provide an effective base on which to build a quality control program.

Recommendations also included the establishment of a system whereby information could flow easily not only from the top down, but also from the bottom up. This would enable employee grievances to reach management without significant delay.

Additonally, it was suggested that management share some of the less significant decisions with the middle managers, and that employees be selected for job assignments strictly on the basis of personal qualifications.

CASE NO. 7 MAIN PRODUCT: PIGMENTS

Municipality: Choong-Nam

Brief Description of Problem

An improper pH value was retarding production output.

Applied Solution

The SJU team recommended that the acidity of the solution in the reactor be maintained above pH 3.0 to attain maximum production. It was suggested that production also might be increased by properly utilizing the relatively high concentration of ferric ion in the residual solution. A recommendation that a continuous reactor system be utilized has been partially implemented.

CASE NO. 8 MAIN PRODUCT: PENCILS

Municipality: Taejon

Brief Description of Problem

Management wished to improve its method of producing demineralized water and to substitute local raw materials for imported materials.

Applied Solution

The SJU team provided information regarding the use of carbon fiber in making pencil lead and the replacement of imported montmorillonite for pencil lead with Korean montmorillonite. Both suggestions are now either under consideration or in the experimentation stage.

A suggested method of regenerating waste ion-exchange resin in preparing demineralized water is now being utilized.

CASE NO. 9 MAIN PRODUCT: TOWELS AND COTTON TEXTILES

Municipality: Taejon

Brief Description of Problem

Uneven color dispersion and spot formations in the printing process.

(Continued)

CASE NO. 9 (Continued)

Applied Solution

The SJU team recommended the use of a cationic form of surfactant as a dispersion agent in order to prevent spot formation. The firm has not yet implemented this suggestion, but it has adopted the recommendation to treat the water used in the dyeing process in order to achieve a more satisfactory product.

CASE NO. 10 MAIN PRODUCT: AGRICULTURAL CHEMICALS

Municipality: Taejon

Brief Description of Problem

Dust in the air and chemical pollution of the finished products.

Applied Solution

The company followed the team's recommendation to seal the entire process line to eliminate dust pollution. The company plans to install the recommended automatic or semi-automatic bottling process. A recommendation that the company determine the effective contents of agricultural chemicals has yet to be implemented.

CASE NO. 11 MAIN PRODUCT: BOILER COMPOUND AND COMBUSTION HELPING AGENT

Municipality: Taejon

Brief Description of Problem

Management requested information on making boiler compounds, on conditioning industrial water, and on a combustion-helping agent for bunker-C fuel oil.

Applied Solution

The SJU team was able to provide information on ways of making a boiler compound which would prevent scale from forming on boilers, on a method of conditioning industrial water, and on a combustion-helping additive for bunker-C fuel oil which would increase the energy efficiency of the company's boiler.

CASE NO. 12 MAIN PRODUCT: TOBACCO PRODUCTS

Municipality: Taejon

Brief Description of Problem

This company formerly made bicycle parts but is now interested in providing products for the tobacco industry.

Applied Solution

The company is now studying the establishment of a new plant to manufacture thin tobacco sheets (micro-flake), using a Korean patented process developed by a member of the SJU team.

CASE NO. 13 MAIN PRODUCT: PAINT AND VARNISH

Municipality: Taejon

Brief Description of Problem

The determination of the proper ingredients to use in a new paint for making traffic lanes.

Applied Solution

The SJU team recommended that a melamine-based coating material should be used for this paint and that a study of fluorescent dyes is essential to the selection of proper raw materials. Both recommendations are under consideration.

CASE NO. 14 MAIN PRODUCT: PIANOS AND WALL CLOCKS

Municipality: Seoul

Brief Description of Problem

Inefficient layout and irregular flow of materials; lack of standards for various operations; and poor quality control, production methods, cost control, working conditions, and woodworking process methods.

(Continued)

CASE NO. 14 (Continued)

Applied Solution

Following discussions with top management about the overall problems, the SJU team prepared operation process charts and a layout diagram for the skeleton manufacturing process (a piano consists of skeleton parts, action and hammer parts, keyboard parts, and other miscellaneous outer parts).

For each subcomponent of the skeleton, flow process charts (including standard operation methods) were then developed.

Relevant procedures and forms were formulated and proposed to estimate direct manufacturing costs which would enable the company to collect data about man-hours used and in-process inventory.

During the provision of extension services for this company, four undergraduate IE students from SJU were heavily involved, making the necessary measurements and collecting data.

The SJU team and participating students developed overall flow process charts for the piano process. New forms for collecting the man-hours data and yield data were devised by the SJU team. Although the data accumulated are far from sufficient to yield precise figures, the company is now in a position to at least calculate rough manufacturing costs.

Most of the woodworking processes produce heavy dusts which the ventilating system in the factory was unable to handle. With the help of SJU, the company was able to improve the ventilation system without excessive expenditures.

Finally, the SJU team proposed a series of improvements in the woodworking process, including a new plant layout.

CASE NO. 15 MAIN PRODUCT: SEWING MACHINES

Municipality: Seoul

Brief Description of Problem

The company needed assistance in determining where to locate new machine tools, devising job standards for the new machines, and in setting up the machines and instructing the employees regarding their operation.

(Continued)

CASE NO. 15 (Continued)

Applied Solution

This company purchased a set of new machine tools. SJU made detailed measurements and developed an actual layout plan using cardboard templates. After minor adjustments, the proposed plan was adopted and the machinery was installed.

Before the installation of the new machines, SJU helped to develop a series of job standards and carried out work measurement for new operations.

Some of the new machines were equipped with hydraulic power drives, and the company had no experience with hydraulic mechanisms. SJU officials and other experts called in by the SJU team solved the problems, got the machines operating, and instructed company employees on how to operate the machines.

CASE NO. 16

MAIN PRODUCT: CATERPILLAR PINS AND BUSHINGS

Municipality: Seoul

Brief Description of the Problem

The firm was experiencing difficulty in getting an acceptable product.

Applied Solution

Rockwell hardness tests were performed by the SJU team on samples of the pins and bushings. After the recommended heat treatment was applied, samples showed quality improvements from 53-50 to 61-59 by C scale. Based on the SJU team suggestion, the carburizing treatment effect was improved by development of an indirect heating system so that the carburizing furnace maintained a constant temperature.

Processing time was reduced about 20% and the inferiority rate about 10% by production of standardized goods through use of jigs and the development of gauges for precision manufacturing. The accuracy of the manufactured products was improved through precision tests of the firm's machine tools and their subsequent readjustment.

CASE NO. 17

MAIN PRODUCT: STEEL CABLE AND DOUBLE CABLE CHAIN: BRASS SOLDERED CHAIN

Municipality: Seoul

Brief Description of Problem

The firm was producing an inferior quality of chain.

Applied Solution

The SJU team determined that the problem was caused by excessive vibration in the plant machinery. It was able to reduce the rate of inferiority from 16% to 9% through the installation of shock absorbers. The team also has begun work on the development of an automatic system for the machines which will stop them when vibration reaches a critical level.

CASE NO. 18

MAIN PRODUCT: TOBACCO PROCESSING

Municipality: Taejon

Brief Description of Problem

An improper slurry concentration was causing production problems.

Applied Solution

The SJU team recommended the use of an adhesive material such as ethyl cellulose, gum guanic, or methyl cellulose to increase the concentration of slurry.

CASE NO. 19

MAIN PRODUCT: PURE SODIUM CHLORIDE

Municipality: Taejon

Brief Description of Problem

The firm wished to dispose of materials and to shorten the waste crystallization time.

(Continued)

CASE NO. 19 (Continued)

Applied Solution

The SJU team recommended and the firm adopted the use of a conveyor system to transport raw sodium chloride into the purification tank. The team also suggested a temperature control method to shorten crystallization time, which the firm plans to act on. The team also recommended and the company adopted a method of utilizing the waste salt water.

CASE NO. 20 MAIN PRODUCT: OXYGEN

Municipality: Choong-Nam

Brief Description of Problem

Utilization of the sodium hydroxide solution produced as a by-product.

Applied Solution

The SJU team recommended utilizing the waste sodium hydroxide solution for soap making or for other processing purposes. The company subsequently was able to find a buyer for this by-product.

CASE NO. 21 MAIN PRODUCT: SALTED VEGETABLES

Municipality: Choong-Nam

Brief Description of Problem

The plant management wanted to increase production and to decrease product drying time during the winter.

Applied Solution

The SJU team recommended the use of a revised cutting tool and the use of a hothouse for drying during the winter season. The firm is in the process of applying both recommendations.

CASE NO. 22 MAIN PRODUCT: COTTON FABRICS

Municipality: Seoul

Brief Description of Problem

Quality control problems involving sizing preparation and loom shuttle timing.

Applied Solution

The SJU team explained the X-R and X-S control charts and instructed management as to how to examine and analyze these charts. The team also instructed them on how to time the shed and adjust the shuttle boxes on the looms.

CASE NO. 23 MAIN PRODUCT: GUT STRINGS FOR TENNIS RACKETS

Municipality: Seoul

Brief Description of Problem

The company needed technical advice concerning cohesion solvent, heat treatment, and finishing.

Applied Solution

The SJU team recommended the use of a mixture of phenol (85%) and methanol (15%), to which is added a dash of cresol and formic acid. The team also recommended a heat treatment for 5 minutes at 160°C and the use of paraffin wax for waxing.

CASE NO. 24 MAIN PRODUCT: MACHINE TOOLS

Municipality: Seoul

Brief Description of Problem

Machine tools parts were not being produced accurately and the finished products were rusting.

(Continued)

CASE NO. 24 (Continued)

Applied Solution

The SJU team instructed employees on the need for and use of formal drawings and provided instructions on the technical theory and use of production fixtures and jigs. They also explained methods of using gauges in manufacturing and inspecting. The team recommended the use of a double nut mechanism to remove backlash in the machining table screw. The management was provided with instructions on use of the Parkerizing process for rustproofing iron and steel. They were also instructed on methods for drawing up system and velocity diagrams for the spindle change mechanism and on how to determine gear strength and teeth for each change mechanism.

CASE NO. 25 MAIN PRODUCT: MACHINE TOOLS AND LATHES

Municipality: Seoul

Brief Description of Problem

Management requested assistance in the casting of lathe beds, improving the plant layout and material flows, quality control, and in measurements and standards.

Applied Solution

The SJU team recommended the application of a numbering system for all parts and the testing and inspection of all purchased parts and materials. They explained the development of fixtures and jigs, their use in manufacturing, and the need for precision manufacturing. Finally, they provided instruction on the technical methods and essential points of casting, such as thickness, involved in the elimination of internal stress in the cast parts.

CASE NO. 26 MAIN PRODUCT: SOYBEAN CURD

Municipality: Tae Duck-Koon

Brief Description of Problem

The high cost of raw materials, utilization of by-products, and short product shelf life.

(Continued)

CASE NO. 26 (Continued)

Applied Solution

The SJU team suggested the use of defatted soybeans as a raw material, because bean curd made with 50% soybean and 50% defatted soybean has the same protein quality as that made of soybean only. It was suggested that the waste bean curd water be sold as a feed for domestic animals, because it contains 0.4% protein and 0.1% crude lipin. The team recommended the use of dilute acetic acid (0.15%-0.20%) in a preservation process that would allow the bean curd to be stored at 30°C for about 100 hours.

CASE NO. 27 MAIN PRODUCT: TOWELS

Municipality: Choong-Nam

Brief Description of Problem

Poor product quality, due to hard water and bleaching problems, and plant air pollution.

Applied Solution

The SJU team provided information about industrial water treatment of underground water to provide the soft water needed in the dyeing process and concerning the use of hydrogen peroxide in the bleaching process. Both of these suggestions were implemented. The team also suggested setting up a dust machine to eliminate cotton fiber dust in the air, but management felt this would be prohibitively expensive. Cost data will be supplied during 1978.

CASE NO. 28 MAIN PRODUCT: CASTINGS

Municipality: Choong-Nam

Brief Description of Problem

The firm required better quality control in order to increase usable production.

(Continued)

CASE NO. 28 (Continued)

Applied Solution

The SJU team informed company management that the yellow pigment used in the making of pickled radishes is harmful to humans and recommended a method of making pickled radishes without using this pigment. The team also pointed out the necessity of keeping the working room clean in order to keep the product sanitary.

Appendix 2

COMMUNITY DEVELOPMENT THROUGH SMALL BUSINESS

COMMUNITY DEVELOPMENT THROUGH SMALL BUSINESS
A KOREAN CASE OF SAEMAUL MOVEMENT

Presented by

Dr. Yoon-Bae Ouh
Director
Integrated Development Center
Soong Jun University
Seoul, Korea

Before the 4th International Symposium on Small Business
held in Seoul, Korea, October 10-13, 1977

1. The predominant problem commonly facing most developing countries is to wipe out the vicious cycles of poverty. Development efforts to this end can be approached through the use of available resources and skilled labor and in the choice of strategy and techniques.

2. However, there is an almost universally accepted feeling among developing country planners and policymakers that industrialization is the most effective way to eliminate their economic handicaps, to achieve a substantial growth of output, and to raise the standard of living of their populations. Therefore, "the standard development strategy of the past two decades emphasized rapidly increased marginal savings, investment, and employment in the modern sector of industry. It generally limited its agricultural concerns to the production of commercial crops to feed urban populations and earn foreign exchange. Its explicit or implicit premise was that it would produce significantly higher marginal rates of savings and investment than alternative strategies, and that the growth of the modern manufacturing sector would eventually ease whatever unemployment problems were developing in rural areas and traditional urban sectors as a result of the concentration of incentives in the modern sector." (1)

2. In pursuing such a development strategy, the highest priority was generally given to the approach which was thought to ensure a high economic growth rate. Given the conditions of capital shortage at the early stages of development, development policymakers deliberately promoted rapid expansion of large-scale industries in view of high productivity, the economy of scale, and other advantages stemming from modern machinery utilization, technology development, marketing techniques, methods of management, and quality control. In other words, they found it very difficult to justify the allocation of scarce resources to small industry sectors in proportion to their large-scale counterparts.

3. As a result, industrial development policies which give preferential treatment to large-scale industries have allowed those industries to almost monopolize the protective measures and other assistance provided by the national governments. The widening gap between small-scale and large-scale sectors and the phenomenon of this economic dual structure in helping the larger get larger and making the small get pettier has resulted in more waste and more problems than anticipated. Furthermore, the urban-centered development strategy of modern industrial sectors has created wider opportunities. In short, the development strategy of the past two decades, which emphasized GNP growth, has failed

not only to provide more employment opportunities for low-income people, especially in nonurban areas, but also to make significant contributions to their standard of living.

5. From the beginning of the 1970s, therefore, government policymakers and development planners became conscious of the serious problems that arose from these sectoral and regional disparities, and began to think of development as an integrated process involving not only economic growth as such, but also the development of social objectives of economic growth, such as income redistribution, institutional changes, equalization of employment opportunities, and the development of especially backward rural areas. It is now widely accepted that successful development cannot be measured in terms of increased GNP and per capita income alone. Rather the indication of successful development is growth along with advances in these social objectives.

6. The Saemaul Undong, the New Community Development Movement, emerged out of this conceptual rethinking and change in development strategy. The Saemaul Undong was aimed at making a rural village a better place to live, through the villagers' own efforts to create a better environment, and to raise the standard of living. The Saemaul Movement developed into a nationwide campaign immediately after President Park Chung-Hee stated in April 1970: "A village can develop rapidly when its villagers are strong in the sense of self-support. Otherwise, a village will hardly be able to escape the poverty inherited from the past 5,000 years. If determined villagers make concerted efforts and do something for community development with the participation of all citizens, I shall see to it that the government provides the necessary support. We may call such a drive a campaign for Saemaul making or a campaign for decent village making." (2)

7. From the beginning, the Saemaul Movement has given top priority to the action programs or projects which could yield spiritual enlightenment, improvement of the living environment, and increased income. As one writer commented, "The Saemaul Movement goes beyond agricultural sector development in that it aims at improvement of the rural environment, changes in the way of thinking, and improvement of the standard of living in addition to seeking increases in the level of production." (3)

8. Of various programs designed to increase farm income through the Saemaul Movement, much emphasis has been placed on the importance and usefulness of the

Saemaul factory (rural small-scale industry) as an instrument of integrated rural community development for equitable distribution of income, employment opportunities, and social services through the people's active participation in the achievement of growth.

9. It is generally assumed that the problems of rural unemployment during and between the farming seasons can be effectively tackled by development projects which employ highly labor-intensive techniques. At the early stage of the Saemaul Movement, the government recommended the following projects: (4)

a. Reforestation of surrounding mountains.
b. Widening of roads connecting the villages to the main road.
c. Repair of river banks near the villages.
d. Construction of manure storage facilities.
e. Repair of small pond reservoirs.
f. Repair of irrigation ponds.
g. Cleaning of village paths and ditches.
h. Construction of public laundry facilities.
i. Rodent control.

10. Later, the Saemaul Factory Movement, not only as a development project but as an effective instrument of rural community development, was introduced alongside the ongoing development projects and efforts aimed at an increase in the production of food grains. It was generally assumed that a Saemaul factory, once established in a rural area, would generate a new source of employment opportunity, both for tapping otherwise unused human and local resources and for more widely and equitably distributing the benefits of growth. It is further assumed that Saemaul factories and other related small businesses which come into being as a result of this movement will provide an effective means of stimulating indigenous entrepreneurship, checking the flow of rural population into the already congested urban centers, decentralizing industrial growth geographically, and helping accelerate capital formation in the rural areas.

11. With a view to achieving these multi-objectives, the government has adopted numerous incentive measures to induce local investment as well as to stimulate the urban industrialists' active participation in the Saemaul Factory Movement in rural areas. Thus, basic infrastructures, administrative services, financial support, tax concessions, and other services were provided in each of the major towns with a population of less than 20,000 in order to stimulate the establishment of Saemaul factories in those areas.

12. More specifically, the following guidelines were laid down: (5)

a. Types of industry to be promoted:

(1) industries for which it is possible to procure raw materials in the rural areas, such as food and beverages; wood and wood products; clay, stone products and ceramics; and paper products.

(2) industries where the production process is simple and labor-intensive industries, such as textiles, sundry goods, synthetic resin products, and glass products.

(3) industries where subcontract relations between small and large firms can be promoted, such as metals, machinery and tools, parts and components.

(4) other industries which may contribute to the increase of farm incomes.

b. Promotional measures to be taken:

(1) provision of equipment and working capital loans to finance the construction and operation of the Saemaul factories.

(2) subsidization of the construction of Saemaul factories in model villages.

(3) subsidization of the training of skilled workers and the development of technology.

(4) provision of concessions in property and acquisition taxes.

(5) assistance to small industries through government purchases.

(6) development of local industrial estates to attract existing small industries or new industries to the rural areas.

(7) establishment of home industry centers to assist rural cottage industries by furnishing such services as training of skilled workers, joint purchase and sales, quality control of the products, and information.

13. It is generally agreed among development experts that in countries like Korea where labor is abundant and low cost owing to rapid population growth, rapid strides in industrial development can be achieved by building on small industries which rely for their steady growth upon the requirements mentioned above -- especially those of labor intensiveness and low investment. Some years ago, UNIDO identified the following advantages of helping existing small industries and promoting new ones in rural areas: (6)

a. Small industrial enterprises provide an effective means of stimulating indigenous entrepreneurship;

b. They can channel the skills of traditional craftsmen into new lines suited to modern economy;

c. They help with the unemployment problem since many small industrial establishments lend themselves to capital-saving methods;

d. They make it possible for the growth of industry to be less concentrated geographically;

e. They assist in diversification of the industrial structure;

f. They can help to tap resources which would otherwise remain unused and thus accelerate capital formation.

12. Like any other development effort, the Saemaul Factory Movement, as an instrument of community development in the rural areas, should be viewed as a long-range strategy requiring systematically organized knowledge and methodologies for successful implementation. Thus, few worthwhile results would be expected from a short-range view. As far as quantitative aspects of results are concerned, however, the Saemaul Factory Movement, since its inception in 1973, has had some positive tangible effects on the Saemaul Movement or New Community Development in terms of employment opportunities, income distribution, and contribution to the national drive to increase exports.

15. As of September 1976, 465 Saemaul factories were newly established throughout the country, with the effects as shown in Table 1.

16. Table 1 shows that in the first year of the Saemaul Factory Movement 17,000 new jobs were created in the nonmetropolitan areas. Resulting new jobs created annually almost tripled by the end of September 1976, totaling 47,000 jobs. It was reported that some of the Saemaul factories fell short of expectation in output, due mainly to the shortage of workers during the farming season. This problem has been eased as agricultural mechanization has progressed. To sum up, the role of the Saemaul factory is noticeable in absorbing the farm unemployed who would otherwise come to urban centers to seek employment. It can be said that the Saemaul Factory Movement is one of the effective answers to the problem of rural unemployment which stems from the seasonal nature of agriculture and the effects of agricultural mechanization.

17. In addition, the rural people now have access to new or additional income opportunities. Until recently, the disparity in incomes between the rural

Table 1

EFFECTS OF THE SAEMAUL FACTORY MOVEMENT, 1973-1976

	1973	1974	1975	1976*
(A) Employment	17	22	34	47
(1,000)	(-)	(29.4)	(54.5)	(38.2)
(B) Total Wages	956	3,570	7,716	11,393
(Million Won)	(-)	(273.4)	(116.1)	(47.7)
(C) Average Monthly Wage per Worker	13,146	21,525	30,729	36,800
(Won)	(-)	(63.7)	(42.8)	(19.8)
(D) Exports (US$1,000)	23,498	56,963	87,132	123,563
	(-)	(142.4)	(53.0)	(41.8)
(E) Production	9,940	26,703	56,444	80,009
(Million Won)	(-)	(168.6)	(111.4)	(41.7)

* January-September only.

Note: Figures in ( ) show percentage increase over the previous year.

Source: R.I.D. Center, Saemaul Factory, Vol. 21 (June 1977), p. 31.

---

and urban sectors, owing mainly to the urban-centered development strategy in nonagricultural sectors, was very significant, showing a considerably lower rate relative to the average urban wage earner. As noted in the following table, average farm household income was 60% of the average urban wage earner's income in 1967 and 67% in 1970. This relationship has reversed since 1974, and the Saemaul Factory Movement is one of the factors contributing to the rapid increase in farm incomes. In the first year of the Saemaul Factory Movement, the average farm income per month was 13,146 Won (equivalent to US$30) in 1973. This increased by 42.1% over the next three years, amounting to 36,800 Won (equivalent to US$80) in September 1976. The total production output made by Saemaul factories in the first year, 1973, as shown in Table 1, constituted 0.2% of gross national product (GNP) for that year. The ratio of total Saemaul factory output to GNP rose to 0.6% at the end of 1975. Its share in the total farm and fishery output increased from 0.8% in 1973 to 2.4% in 1975. (8)

18. With regard to the role of the Saemaul factory in national export, in 1973 their total exports reached US$23,498,000, corresponding to 0.73% of the nation's total exports.

Table 2

AVERAGE INCOME OF FARM AND URBAN WAGE EARNERS' HOUSEHOLDS (7)
(1,000 Won)

Year	Farm (A)	Urban (B)	A/B (%)
1965	112	113	99.1
1966	130	162	80.3
1967	149	249	59.8
1968	179	386	62.6
1969	218	334	65.3
1970	256	381	67.2
1971	356	452	78.8
1972	429	517	83.0
1973	481	550	87.5
1974	674	647	104.5
1975	873	859	101.6

Sources: Ministry of Agriculture and Fisheries, Report on the Result of Farm Household Economy Survey, 1975; and Economic Planning Board, Monthly Statistics.

The total export of the Saemaul factories has steadily increased, reaching 1.71% of the total export in 1975. Regarding exports, it should be noted that most of Saemaul factory products, being labor intensive and utilizing local resources, afford comparative advantages in international competition relative to capital-intensive products made of imported raw materials.

19. In addition, the Saemal Factory Movement has made significant contributions to the implementation of the government's industrial dispersal plan in the regional areas. As shown in Table 3, it was reported that as of September 1976, 53 Saemaul factories had been established in 23 cities out of a total of 34 regional cities in Korea (67.6%). On the average, two Saemaul factories were built in each city. As regards the towns, 412 Saemaul factories were set up in 264 towns, or in 28.1% of the total of 1,468 towns of less than 20,000 population. As mentioned before, it is government policy to induce at least one Saemaul factory to locate in each town. It is only a matter of time until this target is achieved.

Table 3

DISTRIBUTION OF SAEMAUL FACTORIES AMONG CITIES, TOWNS, AND COUNTIES

	Cities	Towns	Counties
Total Number of National Administrative Units (A)	34	1,468	138
Number of National Administrative Units in which there were Saemaul Factory Locations (B)	23	264	100
Number of Saemaul Factory Establishments	53	412	
B/A	67.6%	16.0%	

Source: R.I.D. Center, op. cit., p. 32.

20. It should be mentioned before ending my comments on the effects of the Saemaul Factory Movement that the infrastructures laid down primarily for the purpose of implementing the Saemaul Factory Movement also contribute significantly to improvement in the quality of rural life, through rural electrification, expansion of rural roads and water supply, the establishment of social services for workers, and other improvements in village living conditions. "It is also facilitating specialization of production and the enhancement of complementary and linkage effects between rural and urban industries in support of the nation's goal of industrial dispersion." (9)

21. Given the state of our present knowledge, we can conclude that if community development is viewed as a process of improving the quality of life, through greater productivity and increased access to resources and services, then the Saemaul Movement in general and the Saemaul Factory Movement in particular are an effective strategy for fostering community solidarity, for organizing and delivering basic social services, and for stimulating and consolidating social change and development in the rural areas. This is the lesson which we can learn from the Korean Saemaul Movement.

REFERENCES

(1) Roger D. Hansen, "The Emerging Challenge: Global Distribution of Income and Economic Opportunity," in James W. Howe (ed.), The U. S. and World Development: Agenda for Action 1975 (New York: Praeger Publishers, 1975), p. 170.

(2) Quoted from The Korea Herald, daily English newspaper, August 27, 1976.

(3) Sung Hwan Ban, "The New Community Movement," in Chuk Kyo Kim (ed.), Industrial and Social Development Issues, Essays on the Korean Economy, Vol. II (Seoul, Korea: Korea Development Institute, 1977), p. 211.

(4) Ibid.

(5) For more detailed information, see The Medium Industry Bank (Korea), Policies for Small Industry: Current Status (1974) and Quarterly Review, 1st Quarter, 1973.

(6) United Nations Industrial Development Organization (UNIDO), Small-Scale Industry, Monograph No. 11 (New York: United Nations, 1969).

(7) Requoted from Sung Hwan Ban, op. cit., p. 231.

(8) R.I.D. Center, Saemaul Factory (Korean), Vol. 21 (June 1977), p. 13.

(9) Economic Planning Board, The Korean Economy: Growth, Equity and Structural Change, September 1976, p. 17.